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EXAMINER	
KIM, DAVID S	

ART UNIT	PAPER NUMBER
2633	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/881,448	MISHRA, MANAV	
	Examiner	Art Unit	
	David S. Kim	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 5-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. **Claim 20** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In particular, notice the following limitation:

"at least one secondary hybrid node...to optically circuit switch the switched traffic and the router traffic to another secondary node."

However, the application does not disclose *optically circuit switching* the router traffic. Rather, it discloses *routing* the router traffic (Applicant's specification, p. 7, 2nd-3rd paragraphs, p. 12, 2nd paragraph) or simply *optically switching* the router traffic (Applicant's specification, p. 9-10, bridging paragraph, optical cross connect switch in Fig. 2). In view of the lack of support for this limitation, claim 20 contains subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1-2, 5-15, and 17-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ghani ("Lambda-Labeling: A Framework for IP-over-WDM using MPLS").

Regarding claim 1, Ghani discloses:

A method for provisioning bandwidth in a hybrid network (p. 56, Fig. 14 – for a more legible copy of Fig. 14, see identical figure in Ghani – "Integration Strategies for IP over WDM", figure named "Hybrid Fiber-Wavelength-Packet (FWP) Node"), comprising:

assigning a set of switching wavelengths (WDM channels to wavelength switching/conversion matrix) to traffic in the network, the switching wavelengths being labels to indicate that the traffic is to be switched in optical domain using optical circuit switching;

optically switching traffic that is able to be switched using switching wavelengths between nodes using the set of switching wavelengths;

assigning a set of routing wavelengths (WDM channels to packet switching level, "packet switching" is another common term for routing) to traffic, the routing wavelengths being labels to indicate that traffic is to be routed, undergo conversion from optical domain to electrical domain (O-E module), and undergo conversion from electrical domain back to optical domain (E-O module); and

routing the traffic that cannot be switched using the routing wavelengths.

Ghani does not specifically teach:

assigning a set of routing wavelengths to traffic *that cannot be switched using switching wavelengths.*

However, Ghani also teaches the sharing of resources among different routes (p. 53, col. 1, last paragraph). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to perform said routing. One of ordinary skill in the art would have

been motivated to do this to improve network spare capacity utilization (p. 53, col. 1, last paragraph). That is, if the resources for switching cannot switch the traffic, the resources for routing could do so to complete the traffic transmission.

Regarding claim 2, Ghani discloses:

The method of claim 1, further comprising:

identifying critical nodes in the network;

establishing at least one static path between the identified critical nodes; and

optically switching traffic on the static path using the set of switching wavelengths (circuit switching in Fig. 2 – for a more legible copy of Fig. 2, see identical figure in Ghani et al. – "On IP-over-WDM Integration", p. 81, Fig. 5).

Regarding claim 5, Ghani discloses:

The method of claim 1, further comprising:

statically assigning a set of switching wavelengths to traffic in the network; and

optically switching the traffic between nodes using the set of switching wavelengths (static wavelength routing and circuit-switched wavelength layers in Fig. 2, also sections 3, 3.1, 3.3).

Regarding claim 6, Ghani discloses:

The method of claim 1, further comprising:

dynamically assigning a set of switching wavelengths to traffic in the network; and

optically switching the traffic between nodes using the set of switching wavelengths (adaptive wavelength routing and circuit-switched wavelength layers in Fig. 2, also sections 3.1, 3.2).

Regarding claim 7, Ghani discloses:

A method for sharing bandwidth in a hybrid network (p. 56, Fig. 14 — for a more legible copy of Fig. 14, see identical figure in Ghani - "Integration Strategies for IP over WDM", figure named "Hybrid Fiber-Wavelength-Packet (FWP) Node"), comprising:

labeling traffic to be switched in the network with a set of switching wavelengths (WDM channels to wavelength switching/conversion matrix), the switching wavelengths to indicate that the traffic is to be switched in optical domain using optical circuit switching;

labeling traffic to be routed in the network with a set of routing wavelengths (WDM channels to packet switching level, "packet switching" is another common term for routing), the routing wavelengths being labels to indicate that traffic is to be routed, undergo conversion from optical domain to electrical domain (O-E module), and undergo conversion from electrical domain (E-O module) back to optical domain;

optically switching the traffic labeled with switching wavelengths; and

routing the traffic with routing wavelengths.

Ghani does not expressly disclose:

routing the traffic with routing wavelengths *if the traffic labeled with switching wavelengths cannot be optically switched.*

However, Ghani also teaches the sharing of resources among different routes (p. 53, col. 1, last paragraph). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to perform said routing. One of ordinary skill in the art would have been motivated to do this to improve network spare capacity utilization (p. 53, col. 1, last paragraph). That is, if the resources for switching cannot switch the traffic, the resources for routing could do so to complete the traffic transmission.

Regarding claim 8, Ghani discloses:

The method of claim 7, further comprising:

optically switching the traffic labeled with switching wavelengths using optical circuit switching (Fig. 14, wavelength switching level); and

routing the traffic labeled with routing wavelengths using Internet Protocol (IP) routing (section 4).

Regarding claim 9, Ghani discloses:

The method of claim 8, further comprising:

converting the traffic labeled with routing wavelengths to an electrical domain (O-E module in Fig. 14);

processing the traffic labeled with routing wavelengths in the electrical domain (processing in packet switching level); and

converting the traffic labeled with routing wavelengths back to the optical domain from the electrical domain (E-O module).

Regarding claim 10, Ghani discloses:

The method of claim 7, further comprising:

optically switching the traffic labeled with switching wavelengths using a wavelength network element, an optical cross-connect, an optical network element, an optical switch, a lambda switch, a lambda network element, or a wavelength translator (wavelength switching/conversion matrix in Fig. 14).

Regarding claim 11, Ghani discloses:

The method of claim 7, further comprising:

routing the traffic labeled with routing wavelengths using Open Shortest Path First (OSPF), Resource Reservation Protocol (RSVP), or Border Gateway Protocol (BGP) (p. 51, top of col. 2).

Regarding claim 12, Ghani discloses:

The method of claim 7, further comprising:

routing the traffic labeled with routing wavelengths using an Internet Protocol (IP), asynchronous transport mode (ATM), or frame delay (section 4).

Regarding claim 13, Ghani discloses:

The method of claim 7, further comprising:

labeling traffic to signal and transfer control information updates in the network with a set of control wavelengths (Fig. 13 and section 3.5); and

exchanging routing updates using the set of control wavelengths (control wavelengths are conventionally used for routing updates).

Regarding claim 14, Ghani discloses:

The method of claim 7, further comprising:

labeling traffic to signal and transfer control information updates in the network with a set of control wavelengths (control wavelength(s) in Fig. 13, section 3.5);

appending labeling information on routing updates (p. 49, end of col. 1);

exchanging routing updates and labeling information using the set of control wavelengths (control signaling performed through control wavelength(s) in Fig. 13, section 3.5); and

generating a label map (p. 49, end of col. 1, label mapping) from the routing updates and labeling information.

Regarding claim 15, Ghani discloses:

An apparatus to communicate in a hybrid network (p. 56, Fig. 14 — for a more legible copy of Fig. 14, see identical figure in Ghani - "Integration Strategies for IP over WDM", figure named "Hybrid Fiber-Wavelength-Packet (FWP) Node"), comprising:

switching logic to optically switch traffic carried on a set of switching wavelengths (fiber switching level and wavelength switching level in Fig. 14),

routing logic coupled to the switching logic to route traffic carried on a set of routing wavelengths (packet switching level in Fig. 14);

control logic coupled between the switching logic and the routing logic for receiving information carried on a set of control wavelengths to determine whether traffic is to be directed to the switching logic or the routing logic (section 3, 3.1, 4, and Fig. 13).

Ghani does not expressly disclose:

determining whether *all* traffic is to be directed to the switching logic or *a portion of the traffic that cannot be directed to the switching logic is to be directed to* the routing logic.

However, it is well known in the art that "[c]ircuit switched networks are generally regarded as high-speed and there is certainty that information will reach its intended destination" (application, p. 3, lines 6-7) and that routing is slow and lacks a guarantee that a packet will reach its intended destination (application, p. 2, lines 24-26). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to determine whether or not *all* traffic is to be directed to the switching logic. One of ordinary skill in the art would have been motivated to do this to try to take advantage of the speed and integrity of circuit switched networks (application, p. 3, lines 6-7) before resorting to the alternative of routing with its slower speed and lower integrity (application, p. 1, lines 24-26).

Additionally, Ghani also teaches the sharing of resources among different routes (p. 53, col. 1, last paragraph). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to determine whether or not *a portion of the traffic that cannot be directed to the switching logic is to be directed to* the routing logic. One of ordinary skill in the art would have been motivated to do this to improve network spare capacity utilization (p. 53, col. 1, last paragraph). That is, if the resources for switching cannot switch the traffic, the resources for routing could do so to complete the traffic transmission.

Regarding claim 17, Ghani discloses:

The apparatus of claim 15 wherein the switching logic is further to:

assign a set of routing wavelengths to a portion of the traffic in the network; and

route the portion of traffic between nodes using the set of routing wavelengths (It is inherent to the operation of the nodes shown in Fig. 13 and 14, that the logic assigns a set of routing wavelengths to a portion of the traffic in the network; and routes the portion of the traffic between nodes using the set of routing wavelengths. This is because certain wavelengths are dropped to the packet-switching level in Fig. 14. Also, see section 3.1.).

Regarding claim 18, Ghani discloses:

The apparatus of claim 15 wherein the switching logic is further to:

statically assign a set of switching wavelengths to traffic in the network; and

optically switch the traffic between nodes using the set of switching wavelengths (static wavelength routing and circuit-switched wavelength layers in Fig. 2, also sections 3, 3.1, 3.3).

Regarding claim 19, Ghani discloses:

The apparatus of claim 15 wherein the switching logic is further to:

dynamically assign a set of switching wavelengths to traffic in the network; and

optically switch the traffic between nodes using the set of switching wavelengths (adaptive wavelength routing and circuit-switched wavelength layers in Fig. 2, also sections 3.1, 3.2).

Regarding claim 20, Ghani discloses:

A hybrid communications system, comprising:

a first hybrid node (p. 56, Fig. 14 — for a more legible copy of Fig. 14, see identical figure in Ghani - "Integration Strategies for IP over WDM", figure named "Hybrid Fiber-Wavelength-Packet (FWP) Node") to label switched traffic with a set of switching wavelengths (WDM channels to wavelength switching/conversion matrix), the switching labels being labels to

indicate that the traffic is to be switched in optical domain using optical circuit switching, to send the switched traffic to at least one secondary hybrid node via the set of switching wavelengths, to label traffic with a set of routing wavelengths (WDM channels to packet switching level, "packet switching" is another common term for routing), the routing wavelengths being labels to indicate that traffic is to be routed, undergo conversion from optical domain to electrical domain (O-E module), and undergo conversion from electrical domain back to optical domain (E-O module), to send the traffic to the at least one secondary hybrid node via the set of routing wavelengths; and

at least one secondary hybrid node (also exemplified by Fig. 14) coupled to the first hybrid node (see Figs. 9 and 11) to receive the switched traffic on the set of switching wavelengths and routed traffic on the set of routing wavelengths, to route the routed traffic using an Internet Protocol (IP), asynchronous transport mode (ATM) or frame relay (see top of page 47), and to optically switch (fiber switching level) the switched traffic and the routed traffic to another secondary node.

Ghani does not expressly disclose:

attempting to send the switched traffic to at least one secondary hybrid node via the set of switching wavelengths;

labeling traffic that cannot be sent to the at least one secondary hybrid node using the set of switching wavelengths with a set of routing wavelengths; and

sending the traffic that cannot be sent to the at least one secondary hybrid node using the set of switching wavelengths to the at least one secondary hybrid node via the set of routing wavelengths.

However, it is well known in the art that "[c]ircuit switched networks are generally regarded as high-speed and there is certainty that information will reach its intended

destination" (application, p. 3, lines 6-7). It is also well known in the art that routing is slow and lacks a guarantee that a packet will reach its intended destination (application, p. 2, lines 24-26). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to perform said attempting. One of ordinary skill in the art would have been motivated to do this to try to take advantage of the speed and integrity of circuit switched networks (application, p. 3, lines 6-7) before resorting to the alternative of routing with its slower speed and lower integrity (application, p. 1, lines 24-26).

Additionally, Ghani also teaches the sharing of resources among different routes (p. 53, col. 1, last paragraph). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to perform said labeling and sending in the case that said attempting fails. One of ordinary skill in the art would have been motivated to do this to improve network spare capacity utilization (p. 53, col. 1, last paragraph). That is, if the resources for switching cannot switch the traffic, the resources for routing could do so to complete the traffic transmission.

Regarding claim 21, Ghani discloses:

The system of claim 20 wherein the first and secondary hybrid nodes comprise a wavelength network element, an optical cross-connect, an optical network element, an optical switch, a lambda switch, a lambda network element, or a wavelength translator (multi-fiber spatial switch and wavelength switching/conversion matrix in Fig. 14).

Regarding claim 22, Ghani discloses:

The system of claim 20 wherein the first and secondary hybrid nodes each further comprise logic (Fig. 13) to receive routing updates and label information (p. 49, end of col. 1) via a set of control wavelengths, to generate a label map (p. 49, end of col. 1, label mapping) from the routing updates and labeling information, to generate a switching matrix (p. 49, end of col. 1, OXC settings, matrix relationships) using the label map.

Regarding claim 23, Ghani discloses:

The system of claim 20 wherein the first and secondary hybrid nodes each further comprises logic to store routing (buffering in packet switching level in Fig. 14).

5. **Claims 3 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ghani as applied to claims 1 and 15 above, and further in view of Chang et al. (U.S. Patent No. 6,111,673).

Regarding claim 3, Ghani discloses:

The method of claim 1, further comprising:

dynamically selecting a path for traffic flow (section 3.2);

signaling downstream nodes in the path to establish and maintain the selected path;

optically switching traffic on the selected path using the set of switching wavelengths; and

releasing the selected path.

Ghani does not expressly disclose setting up the path for a predetermined amount of time. Chang et al. teaches setting up a wavelength path for a predetermined amount of time, after which the path is released (Chang et al., col. 7, l. 17-33). At the time the present invention was made, it would have been obvious to one having ordinary skill in the art to set up a wavelength path for a predetermined amount of time, after which the path is released. One having ordinary skill in the art would have been motivated to do this in the case of bursty traffic, in order to accommodate a burst of traffic (Chang et al., col. 7, l. 21-22, 28-29).

Regarding claim 16, Ghani discloses:

The apparatus of claim 15 wherein the switching logic is further to:

dynamically select a path for traffic flow (section 3.2);

signal downstream nodes in the path to establish and maintain the selected path;

optically switch traffic on the selected path using the set of switching wavelengths; and release the selected path.

Ghani does not expressly disclose setting up the path for a predetermined amount of time. Chang et al. teaches setting up a wavelength path for a predetermined amount of time, after which the path is released (Chang et al., col. 7, l. 17-33). At the time the present invention was made, it would have been obvious to one having ordinary skill in the art to set up a wavelength path for a predetermined amount of time, after which the path is released. One having ordinary skill in the art would have been motivated to do this in the case of bursty traffic, in order to accommodate a burst of traffic (Chang et al., col. 7, l. 21-22, 28-29).

Response to Arguments

6. Applicant's arguments filed on 25 May 2004 (Paper No. 14) with respect to claims 1-3 and 5-6 have been considered but are moot in view of the new ground(s) of rejection under Ghani.

7. Applicant's arguments filed on 25 May 2004 (Paper No. 14) with respect to claims 7-23 have been fully considered but they are not persuasive. Applicant's arguments are based on newly introduced limitations to the amended claims. In short, Applicant argues that Ghani does not teach the following newly introduced limitations:

the switching wavelengths being labels to indicate that the traffic is to be switched in the optical domain using optical circuit switching; and

the routing wavelengths being labels to indicate that traffic is to be routed, undergo conversion from optical domain to electrical domain, and undergo conversion from electrical domain back to optical domain.

Examiner respectfully directs attention to Figs. 2 (for a more legible copy of Fig. 2, see identical figure in Ghani et al. – "On IP-over-WDM Integration", p. 81, Fig. 5) and 14 (for a more

legible copy of Fig. 14, see identical figure in Ghani – "Integration Strategies for IP over WDM", figure named "Hybrid Fiber-Wavelength-Packet (FWP) Node") of Ghani. Fig. 2 shows hybrid designs that incorporate both the optical circuit switching of traffic and the routing of traffic. Fig. 14 shows particular wavelengths assigned/being labels so that the node is indicated that certain traffic is to be switched in the optical domain using optical circuit switching (WDM channels to wavelength switching/conversion matrix) and so that the node is indicated that certain traffic is to be routed (WDM channels to packet switching level), undergo conversion from optical domain to electrical domain (O-E module), and undergo conversion from electrical domain back to optical domain (E-O module). In view of these teachings of Ghani, Examiner finds it difficult to consider Applicant's arguments to be persuasive. Accordingly, Examiner respectfully maintains the standing rejections.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Awduche et al. and Ghani et al. are cited to show related teachings about hybrid nodes with both switching and routing functions in the electrical and optical domains. Karasan et al. is cited to show related teachings about implementing electrical and optical cross-connecting functions together.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 571-272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DSK

M. R. SEDIGHIAN
PRIMARY EXAMINER